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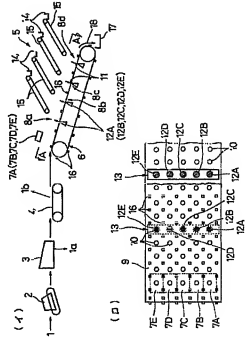
(54)【発明の名称】　廃棄物の選別方法及び装置

(57)【要約】
【課題】　選別される廃棄物の材質毎の純度を高める。
【解決手段】　破袋機２と振動篩３と手選別作業用コンベア４と材質選別装置５を順に配置する。材質選別装置５はベルトコンベア６の上流部に、材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅを幅方向に複数個分割して設け、その下流に、搬送方向に沿って排出部８ａ，８ｂ，８ｃ，８ｄを設ける。排出部８ａ，８ｂ，８ｃ，８ｄは幅方向に複数個並べたエアノズル１２Ａ，１２Ｂ，１２Ｃ，１２Ｄ，１２Ｅをベルトコンベア６のベルト９の送り部下方に備え、ベルト９の搬送面の上方位置に、排出用コンベア１５を設ける。袋から出され、細かい成分１ａ及びひも状の成分１ｂが除かれた廃棄物１が材質選別装置５に導かれると、材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅにより材質と幅方向の位置が検知され、材質と対応する排出部８ａ，８ｂ，８ｃ，８ｄまで搬送され、検知された幅方向の位置と対応するエアノズル１２Ａ，１２Ｂ，１２Ｃ，１２Ｄ，１２Ｅから吹くエア１１により排出コンベア１５上へ排出させる。



【特許請求の範囲】
【請求項1】 搬送コンベアの上流側上方位置に、該コンベアの幅方向に配置した複数個の材質識別装置によりコンベア上の廃棄物の材質を識別し、識別された材質に応じて、上記各材質識別装置に対応させてある複数個の排出部から、上記廃棄物の選択的排出を行わせることを特徴とする廃棄物の選別方法。
【請求項2】 搬送コンベアの上流側上方位置に、搬送される廃棄物の材質を識別するための材質識別装置を該コンベアの幅方向に複数個並べて設置し、且つ幅方向の複数個所から高圧エアにより廃棄物を吹き上げるようにした排出装置を備えてなる排出部を、上記各材質識別装置よりも下流側位置に搬送方向に沿う複数個所に設け、上記各材質識別装置により識別された材質に対応する排出部の所定の排出装置により廃棄物の排出を行わせるようにした構成を有することを特徴とする廃棄物の選別装置。
【請求項3】 搬送コンベアの上流側上方位置に、搬送される廃棄物の材質を識別するための材質識別装置を該コンベアの幅方向に複数個並べて設置し、且つ複数個の排出ゲートを上記各材質識別装置よりも下流側位置に該各材質識別装置に対応させて幅方向に設け、上記各材質識別装置により識別された材質に応じてそれぞれ幅方向に対応する排出ゲートから廃棄物の排出を行わせるようにした構成を有することを特徴とする廃棄物の選別装置。
【発明の詳細な説明】
【0001】
【発明の属する技術分野】本発明は廃棄物に含まれる廃棄プラスチックや紙ごみを、その材質毎に選別するために用いる廃棄物の選別方法及び装置に関するものである。
【0002】
【従来の技術】廃棄物は廃棄プラスチックと紙ごみ等、材質毎に選別する必要があり、このような選別を行うために従来用いられている選別装置としては、搬送コンベアの中間部に配置した材質識別装置により、該搬送コンベア上にて搬送される廃棄物の材質を識別し、たとえば、廃棄物が選別すべき材質の廃棄プラスチックであると識別された場合にのみ、搬送コンベア上からエアで吹き飛ばしたり、上記排出コンベアの下流側に連なるシュートの床面に開閉するよう設けた排出ゲートの如き排出装置を作動させることにより、材質に応じた選別を行わせるようにしている。
【0003】
【発明が解決しようとする課題】ところが、上記従来用いられている選別装置においては、識別装置により、搬送コンベア上にて選別すべき材質の廃棄物の通過が検出されて、該廃棄物の搬送位置が検知されると、上記搬送位置における搬送コンベアの全幅分を一度にエアで吹き飛ばしたり、シュート床面に、幅方向の全面に延びるよう設けた排出ゲートを開放作動させて全幅分を一度に落下排出させるようにしているため、搬送コンベア上で廃棄プラスチックと紙ごみ等、異なる材質の廃棄物が幅方向に並んで搬送されるような場合には、両者を同時に排出させてしまうことから、選別した廃棄物の材質の純度が低いという問題がある。
【0004】そこで、本発明は、材質の異なる廃棄物が搬送コンベア上で幅方向に並んで搬送されていても各材質毎に選別することができて、選別した廃棄物の材質の純度を高めることができる廃棄物の選別方法及び装置を提供しようとするものである。
【0005】
【課題を解決するための手段】本発明は、上記課題を解決するために、搬送コンベアの上流側上方位置に、該コンベアの幅方向に配置した複数個の材質識別装置によりコンベア上の廃棄物の材質を識別し、識別された材質に応じて、上記各材質識別装置に対応させてある複数個の排出部から、上記廃棄物の選択的排出を行わせる廃棄物の選別方法、及び、搬送コンベアの上流側上方位置に、搬送される廃棄物の材質を識別するための材質識別装置を該コンベアの幅方向に複数個並べて設置し、且つ幅方向の複数個所から高圧エアにより廃棄物を吹き上げるようにした排出装置を備えてなる排出部を、上記各材質識別装置よりも下流側位置に搬送方向に沿う複数個所に設け、上記各材質識別装置により識別された材質に対応する排出部の所定の排出装置により廃棄物の排出を行わせるようにした廃棄物の選別装置とする。
【0006】廃棄物が搬送コンベア上に導かれると、該廃棄物は幅方向に並ぶ複数個の材質識別装置の内、単独あるいは複数個により材質が識別されると共に、識別した材質識別装置の位置により搬送コンベア上における幅方向の位置が特定され、これにより、幅方向に並ぶ複数個の排出装置のうち、識別を行った上記材質識別装置の下流に位置する排出装置による高圧エアを用いて排出を行わせることにより、上記廃棄物の検出された幅方向の位置のみによる排出が行われる。
【0007】又、搬送コンベアの上流側上方位置に、搬送される廃棄物の材質を識別するための材質識別装置を該コンベアの幅方向に複数個並べて設置し、且つ複数個の排出ゲートを上記各材質識別装置よりも下流側位置に該各材質識別装置に対応させて幅方向に設け、上記各材質識別装置により識別された材質に応じてそれぞれ幅方向に対応する排出ゲートから廃棄物の排出を行わせるようにした構成とすることにより、材質識別装置の位置により、対応する排出ゲートが開かれる。
【0008】
【発明の実施の形態】以下、本発明の実施の形態を図面を参照して説明する。
【0009】図1（イ）（ロ）及び図2は本発明の廃棄

物の選別方法及び装置の実施の一形態を示すもので、袋に入れて回収された廃棄物１を袋から出すための破袋機２と、上記廃棄物中のサイズの細かい成分１ａを取り除くための振動篩３と、自動選別の行い難いひも状物等の処理不適物１ｂを手作業にて取り除くための手選別作業用コンベア４とを順に設置すると共に、該手選別作業用コンベア４の下流側位置に、廃棄物１をその材質毎に選別するための材質選別装置５を設ける。

【００１０】上記材質選別装置５は、上記手選別作業用コンベア４より受けた廃棄物１を搬送するためのベルトコンベア６を搬送方向へやや下り勾配となるよう傾斜させて配置し、且つ該ベルトコンベア６の搬送方向上流側位置の上方に、幅方向に複数個（図１（ロ）では５個）の材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅを設け、更に、上記ベルトコンベア６上方の各材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅより下流側位置に、廃棄物１の材質にそれぞれ対応した各排出部８ａ，８ｂ，８ｃ，８ｄを、搬送方向の複数個所に設けた構成とする。

【００１１】詳述すると、上記各排出部８ａ，８ｂ，８ｃ，８ｄは、ベルトコンベア６のベルト９の長手方向の全長にわたり所定間隔で、上記各材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅに対応させてベルト９の幅方向に瞬間した エア吹き出し用の孔１０を通して下方から上方へ高圧のエア１１を吹き出してベルト９の搬送面上を搬送される廃棄物１をベルト９の搬送面より上方へ吹き上げるようにするために、ベルト９の搬送面側の下側に配置した排出装置としてのエアノズル１２Ａ，１２Ｂ，１２Ｃ，１２Ｄ，１２Ｅよりなるエアノズルユニット１３と、該各エアノズルユニット１３のエアノズル１２Ａ～１２Ｅより吹き出される高圧エア１１により搬送面上から吹き上げられる廃棄物１を受けて上端部に設けた排出トレイ１４に送って排出させるようにする搬送面の上方位置に設けた排出コンベア１５とを備え、更に、上記エアノズルユニット１３の各エアノズル１２Ａ，１２Ｂ，１２Ｃ，１２Ｄ，１２Ｅをそれぞれ図示しないエア供給部に接続して各エアノズル毎に独立してエア１１の吹き出しを行えるようにした構成とし、上記各材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅのそれぞれの下流側位置において搬送面上の廃棄物１を排出コンベア１５へ吹き上げて排出することができるようにしてある。

【００１２】上記材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅとしては、たとえば、ＰＥＴ、ＰＶＣ、その他のプラスチック、及び紙の四種の材質を識別することのできるものを用いるようにする。又、ベルト９の表面の搬送面には、すべり止め１６が突設してあり、廃棄物１を孔１０の上方位置に保持して材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅにて材質を識別した廃棄物１のそれぞれの位置が搬送中にずれることがないようにしてある。１７は上記材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅにて識別されず、したがっていずれの排出部８ａ，８ｂ，８ｃ，８ｄにおいても排出の行われない金属や陶器などの異物１８を受けるためにベルトコンベア６の下流側端部に設けた異物受けである。

【００１３】袋に入れて回収されて、破袋機２にて袋から取り出された後、振動篩３によりサイズの細かい成分１ａが取り除かれ、更に、手選別作業用コンベア４において処理不適物１ｂを取り除いてある廃棄物１が材質選別装置５に供給されると、ベルト９に沿い幅方向に分割されて並べられている材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅにより廃棄物１の材質が識別される。

【００１４】今、たとえば、ベルト９の片側を廃棄物１が送られていて、材質識別装置７Ａがその材質を識別すると、識別された材質に応じて、廃棄物１を搬送方向に並ぶ排出部８ａ，８ｂ，８ｃ，８ｄのうち、たとえば、排出部８ａのエアノズル１２Ａからの高圧エア１１により排出コンベア１５上への排出を行わせるようにする。

【００１５】すなわち、図２に示す如く、たとえば、材質選別装置５のベルトコンベア６上に幅方向に並んで廃棄物１としての廃ＰＥＴボトル１９と廃ＰＶＣ２０と紙ごみ２１が送られているような場合において、材質識別装置のうち７Ａ，７Ｂ，７Ｃによりボトル１９の材質が、又、７Ｄにより廃ＰＶＣ２０の材質が、更に７Ｅにより紙ごみ２１の材質がそれぞれ識別されると、たとえば、材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅ部を通過したり１秒後に、最上流側の排出部８ａにおいて、上記材質識別装置７Ａ，７Ｂ，７Ｃに対応するエアノズル１２Ａ，１２Ｂ，１２Ｃより高圧エア１１が吹き出されるように、図示しない制御装置によりエア供給部からエアが供給されて、上記廃ＰＥＴボトル１９のみを図２に一点鎖線で示す如く、排出コンベア１５へ吹き上げて排出させる。次に、図３に示す如く、ベルトコンベア６の搬送面上に残る廃ＰＶＣ２０と紙ごみ２１が該ベルトコンベア６により搬送されて上記排出部８ａの通過の１秒後に、図３に二点鎖線で示す如く、該排出部８ａの下流側に位置する排出部８ｂに達すると、該排出部８ｂにおいて、材質識別装置７Ｄに対応するエアノズル１２Ｄより高圧エア１１が吹き出されて、ＰＶＣ２０のみを図３に一点鎖線で示す如く、排出コンベア１５へ吹き上げて排出させる。次いで、図４に示す如く、ベルトコンベア６の搬送面上に残る紙ごみ２１が上記排出部８ｂを通過した１秒後に、図４に二点鎖線で示す如く、該排出部８ｂの下流側に位置する排出部８ｃに達すると、該排出部８ｃにおいて、材質識別装置７Ｅに対応するエアノズル１２Ｅより高圧エア１１が上記と同様に吹き出されて、図４に一点鎖線で示す如く、上記紙ごみ２１を排出コンベア１６へ吹き上げて排出させるようにする。

【００１６】このように、ベルトコンベア６の搬送面を幅方向に複数分割して、各分割部分毎に通過する廃棄物１の種類を材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅにより識別し、該各材質識別装置７Ａ，７Ｂ，７Ｃ，７

D，７Ｅにより識別された材質毎に予め設定された排出部８ａ，８ｂ，８ｃ，８ｄにおいて、搬送面を幅方向に複数分割した部分毎に排出の実施、不実施をそれぞれ決定させるようにしていることから、材質選別装置５のベルトコンベア６により異なる材質の廃棄物１が幅方向に並んで搬送される場合でも各廃棄物１を材質毎に選別することができ、したがって、選別した廃棄物１の材質の純度を高めることができる。

【００１７】次に、図５（イ）（ロ）は本発明の実施の他の形態を示すもので、図１（イ）（ロ）に示したものと同様に、袋に入れて回収されて、破袋機２にて袋から取り出された後、振動篩３によりサイズの細かい成分１ａが取り除かれ、更に、手選別作業用コンベア４において処理不適物１ｂを取り除いてある廃棄物１が供給されるようにしてあるベルトコンベア２３の途中位置の上方に、幅方向に複数に分割して廃棄物１の材質を識別するための材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅを設け、更に、上記ベルトコンベア２３の下流側に、排出装置２５を配置して、材質選別装置２２を構成する。

【００１８】上記排出装置２５は、上記ベルトコンベア２３の下流端に連設したシュート２４と、該シュート２４の中間部に形成した開口部２６と、該開口部２６を閉塞するように開口部２６上縁に上下方向へ回動自在に取り付けられて開口部２６の幅方向に並べられた複数の排出ゲート２７Ａ，２７Ｂ，２７Ｃ，２７Ｄ，２７Ｅと、該各排出ゲート２７Ａ～２７Ｅの背面側に連結されて各排出ゲート２７Ａ～２７Ｅを単独に開閉させるようにする流体圧シリンダの如きアクチュエータ２８とからなるゲート式の構成としてある。２９はシュート２４の下方位置に設けた排出トレイである。なお、上記各排出ゲート２７Ａ～２７Ｅ材質識別装置７Ａ～７Ｅに対応させてある。

【００１９】本実施の形態によれば、ベルトコンベア２３の搬送面上に幅方向に点在した状態で搬送される廃棄物１の種類をコンベアの幅方向に分割して設けられている材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅにより個別に識別し、該各材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅのいずれかにより識別されたごみの材質に応じて、排出装置２５の排出ゲート２７Ａ，２７Ｂ，２７Ｃ，２７Ｄ，２７Ｅのうちの対応する排出ゲートのアクチュエータ２８が図示しない制御装置からの指令により作動させられて、排出ゲートを図５（イ）に二点鎖線で示す如く開作動させることにより、シュート２４の開口部２６を通して排出トレイ２９に落下排出させることができる。

【００２０】したがって、ベルトコンベア２３上に異なる材質の廃棄物１が幅方向に並べられた状態で搬送された場合でも、各廃棄物１のうち、たとえば、紙ごみのみを選別して、分離することができ、選別した廃棄物１の材質の純度を高めることができる。

【００２１】なお、本発明は上記実施の形態のみに限定されるものではなく、図１（イ）（ロ）及び図３（イ）（ロ）では、材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅは幅方向に５個並べて設けたものを示したが、該材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅの幅方向の分割個数は、ベルトコンベア６の搬送面の幅に応じて増減させてよく、又、該材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅの幅方向の個数に対応して図１（イ）（ロ）に示したエアノズル１２Ａ，１２Ｂ，１２Ｃ，１２Ｄ，１２Ｅの幅方向の配置個数や図５（イ）（ロ）に示した如き排出ゲート２７Ａ，２７Ｂ，２７Ｃ，２７Ｄ，２７Ｅの幅方向の配置個数は増減させてよいこと、図１（イ）（ロ）に示したものでは、搬送方向に４列の排出部８ａ，８ｂ，８ｃ，８ｄを並べて設けたものを示したが、材質識別装置７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅによる識別が可能な範囲内であればその列数は自在に決定してよいこと、図５（イ）（ロ）において、ベルトコンベア２３と排出装置２５の組み合わせを、選別すべき廃棄物の種類に応じて搬送方向に複数段設けることは任意であること、その他、本発明の要旨を逸脱しない範囲内において種々変更を加え得ることは勿論である。

【００２２】

【発明の効果】以上述べた如く、本発明の廃棄物の選別方法及び装置によれば、搬送コンベアの上流側上方位置に、該コンベアの幅方向に配置した複数個の材質識別装置によりコンベア上の廃棄物の材質を識別し、識別された材質に応じて、上記各材質識別装置に対応させてある複数個の排出部から、上記廃棄物の選択的排出を行わせる方法とし、又、搬送コンベアの上流側上方位置に、搬送される廃棄物の材質を識別するための材質識別装置を該コンベアの幅方向に複数個並べて設置し、且つ幅方向の複数個所から高圧エアにより廃棄物を吹き上げるようにした排出装置を備えてなる排出部を、上記各材質識別装置よりも下流側位置に搬送方向に沿う複数個所に設け、上記各材質識別装置により識別された材質に対応する排出部の所定の排出装置により廃棄物の排出を行わせるようにした構成としてあるので、異なる材質の廃棄物が幅方向に並ぶように受けられた場合であっても所要の幅単位で各廃棄物を材質毎に選別することができ、更に、搬送コンベアの上流側上方位置に、搬送される廃棄物の材質を識別するための材質識別装置を該コンベアの幅方向に複数個並べて設置し、且つ複数個の排出ゲートを上記各材質識別装置よりも下流側位置に該各材質識別装置に対応させて幅方向に設け、上記各材質識別装置により識別された材質に応じてそれぞれ幅方向に対応する排出ゲートから廃棄物の排出を行わせるようにした構成とすることにより、排出ゲートの開閉で廃棄物の選別を容易に行うことができ、したがって、選別した廃棄物の材質の純度を高めることができるという優れた効果を発揮する。

【図面の簡単な説明】

【図１】本発明の廃棄物の選別方法及び装置の実施の一形態を示すもので、（イ）は全体概略側面図、（ロ）は（イ）のＡ−Ａ矢視拡大図である。

【図２】図１の装置の材質選別装置を示す一部切断概略斜視図である。

【図３】図１の装置の材質選別装置において、ベルトコンベア上に残る廃ＰＶＣと紙ごみを搬送する状態を示す一部切断概略斜視図である。

【図４】図１の装置の材質選別装置において、ベルトコンベア上に残る紙ごみを搬送する状態を示す一部切断概略斜視図である。

【図５】本発明の実施の他の形態の材質選別装置を示すもので、（イ）は概略側面図、（ロ）は概略平面図である。

【符号の説明】

１　廃棄物

５　材質選別装置

６　ベルトコンベア（搬送コンベア）

７Ａ，７Ｂ，７Ｃ，７Ｄ，７Ｅ　材質識別装置

８ａ，８ｂ，８ｃ，８ｄ　排出部

１２Ａ，１２Ｂ，１２Ｃ，１２Ｄ，１２Ｅ　エアノズル（排出装置）

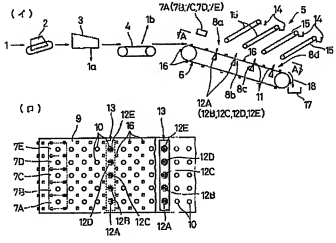
２２　材質選別装置

２３　ベルトコンベア（搬送コンベア）

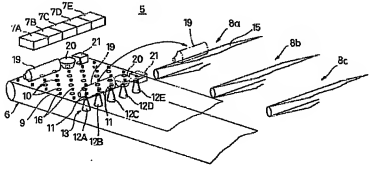
２５　排出装置

２７Ａ，２７Ｂ，２７Ｃ，２７Ｄ，２７Ｅ　排出ゲート

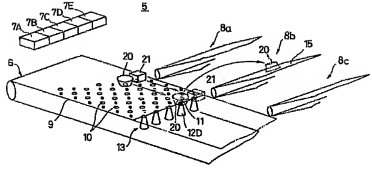
【図１】



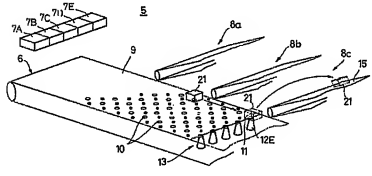
【図２】



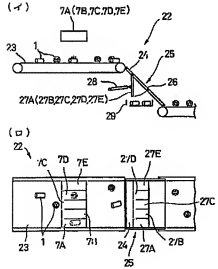
【図3】


5
7A
7B
7C
7D
7E
8a
8b
8c
15
6
20
21
9
10
11
12D
13

【図4】


5
7A
7B
7C
7D
7E
8a
8b
8c
15
6
9
21
10
11
12E
13

【図5】


(イ)
7A(7B,7C,7D,7E)
22
23
1
24
25
26
28
27A(27B,27C,27D,27E)
29
(ロ)
22
7C
7D
7E
27D
27E
27C
23
1
7A
7B
24
27A
25

フロントページの続き

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METHOD AND APPARATUS FOR SORTING WASTE

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- European:
Application number: JP19990148715 19990527
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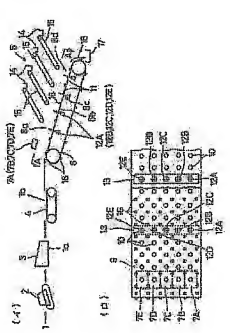
Abstract of JP 2000334390 (A)

PROBLEM TO BE SOLVED: To improve the purity of sorted wastes by material. SOLUTION: A bag breaking machine 2, a vibrating sifter 3, a conveyer 4 for manual sorting work, and a material sorting apparatus 5 are arranged in turn. In the apparatus 5, material discrimination apparatuses 7A, 7B, 7C, 7D, 7E, which are divided in the width direction, are installed upstream from a belt conveyer 6, and discharge parts 8a, 8b, 8c, 8d are formed in the conveyance direction downstream from the discrimination apparatuses. The discharge parts 8a, 8b, 8c, 8d are provided with air nozzles 12A, 12B, 12C, 12D, 12E which are arranged in the width direction below the feed part of the belt 9 of the belt conveyer 6, and a discharging conveyer 15 is installed above the conveyance surface of the belt 9. When waste 1 taken out from a bag, with small components 1a and string-shaped components 1b removed, is led to the apparatus 5, materials and their width-directional positions are detected by the apparatuses 7A, 7B, 7C, 7D, 7E, and the materials are conveyed to the discharge parts 8a, 8b, 8c, 8d corresponding to the materials and discharged on the conveyer 15 by air 11 ejected from the air nozzles 12A, 12B, 12C, 12D, 12E corresponding to the detected width-directional positions.



CLAIMS

[Claim(s)]

[Claim 1]To an upstream upper position of a carrying conveyer, construction material of waste on a conveyor is identified with two or more material discrimination devices arranged crosswise [of this conveyor], A selecting method of waste characterized by making alternative discharge of the above-mentioned waste perform according to identified construction material from two or more discharge parts to which each above-mentioned material discrimination device is made to have corresponded.

[Claim 2]Crosswise, arrange two or more material discrimination devices for identifying construction material of waste conveyed crosswise [of this conveyor], and they are installed in an upstream upper position of a carrying conveyer, And a discharge part provided with the exhaust it was made to pressure upwards waste by a high pressure air from two or more places of the cross direction, A selector of waste having the composition it was made to make waste discharge with the predetermined exhaust of a discharge part corresponding to construction material which provided in two or more places which meet a transportation direction at a downstream position, and was identified by each above-mentioned material discrimination device rather than each above-mentioned material discrimination device.

[Claim 3]Crosswise, arrange two or more material discrimination devices for identifying construction material of waste conveyed crosswise [of this conveyor], and they are installed in an upstream upper position of a carrying conveyer, And rather than each above-mentioned material discrimination device, make this each material discrimination device correspond to a downstream position, and two or more discharge gates are provided crosswise, A selector of waste having the composition it was made to make waste discharge from a discharge gate corresponding to the cross direction according to construction material identified by each above-mentioned material discrimination device, respectively.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the selecting method and device of waste which are used in order to sort out the disposal plastic and paper garbage which are contained in waste for every construction material of the.
[0002]
[Description of the Prior Art]As a selector conventionally used in order for the waste to sort out a disposal plastic, paper garbage, etc. for every construction material and to perform such sorting, With the material discrimination device arranged to the pars intermedia of a carrying conveyer, the construction material of the waste conveyed on this carrying conveyer is identified, For example, only when it is identified that it is an abandonment plastic of the construction material which waste should sort out, He is trying to make sorting according to construction material perform by blowing away with exhaust air from on a carrying conveyer, or operating the exhaust like the discharge gate provided so that it might open and close to the floor line of the shot which stands in a row in the downstream of the above-mentioned discharging conveyor.
[0003]
[Problem(s) to be Solved by the Invention]However, in the selector used conventionally [above-mentioned], If passage of the waste of the construction material which should be sorted out on a carrying conveyer is detected and the carrying position of this waste is detected by an identification unit, In order to blow away a part for the overall width of the carrying conveyer in the above-mentioned carrying position with exhaust air at once, or to make a shot floor line carry out the opening operation of the discharge gate provided so that it might extend all over the cross direction and to try to make it carry out dropping ejection of the part for overall width at once, When wastes of different construction material, such as a disposal plastic and paper garbage, are conveyed along with the cross direction on a carrying conveyer, there is a problem that the purity of the construction material of the waste sorted out is low, from making both discharge simultaneously.
[0004]Then, this invention can be sorted out for every construction material, even if the waste in which construction material differs is conveyed along with the cross direction on the carrying conveyer, and it is going to provide the selecting method and device of waste which can raise the purity of the construction material

of the waste sorted out.

[0005]

[Means for Solving the Problem]In order that this invention may solve an aforementioned problem, to an upstream upper position of a carrying conveyer. Construction material of waste on a conveyor is identified with two or more material discrimination devices arranged crosswise [of this conveyor], According to identified construction material, from two or more discharge parts to which each above-mentioned material discrimination device is made to have corresponded. To a selecting method of waste to which alternative discharge of the above-mentioned waste is made to perform, and an upstream upper position of a carrying conveyer. Arrange two or more material discrimination devices for identifying construction material of waste conveyed crosswise [of this conveyor], and they are installed in it, And a discharge part provided with the exhaust it was made to pressure upwards waste by a high pressure air from two or more places of the cross direction, It provides in two or more places which meet a transportation direction rather than each above-mentioned material discrimination device at a downstream position, and is considered as a selector of waste it was made to make waste discharge with the predetermined exhaust of a discharge part corresponding to construction material identified by each above-mentioned material discrimination device.

[0006]If waste is led on a carrying conveyer, construction material will be identified by independent or plurality among two or more material discrimination devices located crosswise in a line, and this waste. It is pinpointed by position of the cross direction on a carrying conveyer by the position of an identified material discrimination device, and by this, Discharge only by a position of the cross direction where the above-mentioned waste was detected is performed by making it discharge using a high pressure air by the exhaust located downstream from the above-mentioned material discrimination device which performed discernment among two or more exhausts located crosswise in a line.

[0007]Crosswise, arrange two or more material discrimination devices for identifying construction material of waste conveyed crosswise [of this conveyor], and they are installed in an upstream upper position of a carrying conveyer, And rather than each above-mentioned material discrimination device, make this each material discrimination device correspond to a downstream position, and two or more discharge gates are provided crosswise, A corresponding discharge gate is opened by position of a material discrimination device by having composition it was made to make waste discharge from a discharge gate corresponding to the cross direction according to construction material identified by each above-mentioned material discrimination device, respectively.

[0008]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described with reference to drawings.

[0009]Drawing 1 (b) (**) and drawing 2 are what shows the selecting method of the waste of this invention, and one gestalt of operation of a device, The bag tearing machine 2 for taking out the waste 1 which put into the bag and were collected from a bag, and the vibration screen 3 for removing the ingredient 1a with fine size in the above-mentioned waste, The operating conveyor 4 classified by hand sorting for removing manually the processing unsuitable things 1b, such as a string-like thing

which automatic sorting cannot perform easily, is installed in order, and the construction material selector 5 for sorting out the waste 1 for every construction material of the in the downstream position of this operating conveyor 4 classified by hand sorting is formed.

[0010]Make the band conveyor 6 for conveying the waste 1 which received from the above-mentioned operating conveyor 4 classified by hand sorting incline so that it may become a downhill grade a little to a transportation direction, and the above-mentioned construction material selector 5 arranges it, And the material discrimination devices [two or more / above the transportation direction upstream position of this band conveyor 6 / crosswise / (the drawing 1 (**) five pieces)] 7A, 7B, 7C, 7D, and 7E are formed, Each discharge parts 8a, 8b, 8c, and 8d respectively corresponding to the construction material of the waste 1 are made a downstream position with the composition provided in two or more places of the transportation direction from each material discrimination devices 7A, 7B, 7C, 7D, and 7E of the above-mentioned band-conveyor 6 upper part.

[0011]When it explains in full detail, each above-mentioned discharge parts 8a, 8b, 8c, and 8d, Covering the overall length of the longitudinal direction of the belt 9 of the band conveyor 6, with a prescribed interval. It lets the hole 10 for exhaust air blow off which each above-mentioned material discrimination devices 7A, 7B, 7C, 7D, and 7E were made to correspond, and was drilled crosswise [of the belt 9] pass. In order to pressure upwards upwards the waste 1 which the high-pressure exhaust air 11 is blown off [waste] from a lower part upwards, and has a conveyance face top of the belt 9 conveyed from the conveyance face of the belt 9, The air-nozzle unit 13 which consists of the air nozzles 12A, 12B, 12C, 12D, and 12E as the exhaust arranged to the conveyance face side down side of the belt 9, Have the discharging conveyor 15 formed in the upper position of the conveyance face send to the discharging tray 14 provided in the upper bed part in response to the waste 1 pressured upwards from a conveyance face by the high pressure air 11 which blows off from the air nozzles 12A-12E of each of this air-nozzle unit 13, and it is made to make discharge, and further, It has composition which connects with the air supply part which does not illustrate each air nozzles 12A, 12B, 12C, 12D, and 12E of the above-mentioned air-nozzle unit 13, respectively, and enabled it to blow off the exhaust air 11 independently for every air nozzle, In each downstream position of each above-mentioned ********** 7A, 7B, 7C, 7D, and 7E, the waste 1 on a conveyance face is pressured upwards to the discharging conveyor 15, and it enables it to have discharged.

[0012]As the above-mentioned material discrimination devices 7A, 7B, 7C, 7D, and 7E, what can identify PET, PVC, other plastics, and four sorts of construction material of paper is used, for example. 16 has protruded on the conveyance face of the surface of the belt 9 stop sliding, and it is made to have not shifted while each position of the waste 1 which held the waste 1 to the upper position of the hole 10, and identified construction material with the material discrimination devices 7A, 7B, 7C, 7D, and 7E conveys. 17 is the foreign matter receptacle provided in the downstream end of the band conveyor 6, in order to receive the foreign matters 18 in which it is not identified with the above-mentioned material discrimination devices 7A, 7B, 7C, 7D, and 7E, therefore discharge is not performed in which discharge parts 8a, 8b, 8c, and 8d, such as metal and earthenware.

[0013]After putting into a bag, being collected and being taken out from a bag with

the bag tearing machine 2, the ingredient 1a with fine size is removed by the vibration screen 3, If the waste 1 which has removed the processing unsuitable thing 1b in the operating conveyor 4 classified by hand sorting is supplied to the construction material selector 5, the construction material of the waste 1 will be identified by the material discrimination devices 7A, 7B, 7C, 7D, and 7E which are divided crosswise along with the belt 9 and put in order.

[0014]If one side of the now 9, for example, a belt, is sent in the waste 1 and the material discrimination device 7A identifies the construction material, It is made to make the high pressure air 11 from the air nozzle 12A of the discharge part 8a perform discharge of a up to [the discharging conveyor 15] according to the identified construction material among the discharge parts 8a, 8b, 8c, and 8d located in a line with a transportation direction in the waste 1.

[0015]Namely, in the case where it is assumed that waste PET bottle 19 as the waste 1, waste PVC20, and the paper garbage 21 are sent along with the cross direction on the band conveyor 6 of the construction material selector 5 as shown in drawing 2, the inside 7A, 7B, and 7C of a material discrimination device -- the construction material of PET bottle 19 -- 7D -- the construction material of waste PVC20, if the construction material of the paper garbage 21 is identified by 7E, respectively, For example, in the discharge part 8a by the side of the Mogami style 1 second after passing the material discrimination devices 7A, 7B, 7C, and 7D and the 7E section, So that the high pressure air 11 may blow off from the air nozzles 12A, 12B, and 12C corresponding to the above-mentioned material discrimination devices 7A, 7B, and 7C, Exhaust air is supplied from an air supply part by the control device which is not illustrated, and it is made to pressure upwards and discharge to the discharging conveyor 15, as a dashed dotted line shows only above-mentioned waste PET bottle 19 to drawing 2. Next, as shown in drawing 3, waste PVC20 and the paper garbage 21 which remain on the conveyance face of the band conveyor 6 are conveyed on this band conveyor 6, and 1 second after passage of the above-mentioned discharge part 8a, In [if the discharge part 8b located in the downstream of this discharge part 8a is reached as a two-dot chain line shows to drawing 3] this discharge part 8b, The high pressure air 11 blows off from the air nozzle 12D corresponding to the material discrimination device 7D, and it is made to pressure upwards and discharge to the discharging conveyor 15, as a dashed dotted line shows only PVC20 to drawing 3. Subsequently, in [if the discharge part 8c located in the downstream of this discharge part 8b is reached as a two-dot chain line shows to drawing 4] 1 second after the paper garbage 21 which remains on the conveyance face of the band conveyor 6 passes the above-mentioned discharge part 8b, as shown in drawing 4] this discharge part 8c, The high pressure air 11 blows off from the air nozzle 12E corresponding to the material discrimination device 7E like the above, and the above-mentioned paper garbage 21 is pressured upwards to the discharging conveyor 16, and it is made to make it discharge, as a dashed dotted line shows to drawing 4.

[0016]Thus, divide two or more conveyance faces of the band conveyor 6 crosswise, and the kind of waste 1 passed for every divided part is identified with the material discrimination devices 7A, 7B, 7C, 7D, and 7E, In the discharge parts 8a, 8b, 8c, and 8d which were identified by these each material discrimination devices 7A, 7B, 7C, 7D, and 7E and which were beforehand set up for every construction material, From trying to make implementation of discharge, and non-working

determine for every portion which divided two or more conveyance faces crosswise, respectively. The purity of the construction material of the waste 1 which could sort out each waste 1 for every construction material even when the waste 1 of the construction material which changes with band conveyors 6 of the construction material selector 5 was conveyed along with the cross direction, therefore was sorted out can be raised.

[0017]Next, drawing 5 (b) (**) like what shows other gestalten of operation of this invention and was shown in drawing 1 (b) (**), After putting into a bag, being collected and being taken out from a bag with the bag tearing machine 2, the ingredient 1a with fine size is removed by the vibration screen 3, The waste 1 which has removed the processing unsuitable thing 1b in the operating conveyor 4 classified by hand sorting in the middle of the band conveyor 23 on which it is made to be supplied above a position, The material discrimination devices 7A, 7B, 7C, 7D, and 7E for dividing into plurality crosswise and identifying the construction material of the waste 1 are formed, further, the exhaust 25 is arranged to the downstream of the above-mentioned band conveyor 23, and the construction material selector 22 is constituted in it.

[0018]The shot 24 which formed the above-mentioned exhausts 25 successively at the downstream end of the above-mentioned band conveyor 23, The opening 26 formed in the pars intermedia of this shot 24, and two or more discharge gates 27A, 27B, 27C, 27D, and 27E which were attached to opening 26 upper limb, enabling the free rotation to a sliding direction, and were arranged in crosswise [of the opening 26] so that this opening 26 might be blockaded, It has gate type composition which consists of the actuator 28 like the fluid pressure cylinder is connected with the back side of each of these discharge gates 27A-27E, and it is made to make each discharge gates 27A-27E open and close independently. 29 is the discharging tray provided in the downward position of the shot 24. Each above-mentioned discharge gate 27A - the 27E material discrimination devices 7A-7E are made to have corresponded.

[0019]According to this embodiment, the kind of waste 1 conveyed in the state where it was dotted crosswise on the conveyance face of the band conveyor 23 is individually identified with the material discrimination devices 7A, 7B, 7C, 7D, and 7E which divide crosswise [of a conveyor] and are formed, According to the construction material of the garbage identified by either of these each material discrimination devices 7A, 7B, 7C, 7D, and 7E, It is operated by the instructions from the control device which the actuator 28 of the discharge gate where it corresponds of the discharge gates 27A, 27B, 27C, 27D, and 27E of the exhaust 25 does not illustrate, By carrying out an opening operation, as a two-dot chain line shows a discharge gate to drawing 5 (b), dropping ejection can be carried out to the discharging tray 29 through the opening 26 of the shot 24.

[0020]Therefore, even when the waste 1 of different construction material on the band conveyor 23 is conveyed in the state where it was arranged crosswise, only paper garbage is sorted out among each waste 1, it can dissociate and the purity of the construction material of the waste 1 sorted out can be raised.

[0021]Although this invention is not limited only to the above-mentioned embodiment and the material discrimination devices 7A, 7B, 7C, 7D, and 7E showed what was put in order and provided crosswise [five] by drawing 1 (b) (**) and drawing 3 (b) (**), The division number of the cross direction of these material discrimination

devices 7A, 7B, 7C, 7D, and 7E, May make it fluctuate according to the width of the conveyance face of the band conveyor 6, and again, It corresponds to the number of the cross direction of these material discrimination devices 7A, 7B, 7C, 7D, and 7E. By what was shown in that it may be made to fluctuate and drawing 1 (b) (**), the arrangement number of the cross direction of the **** discharge gates 27A, 27B, 27C, 27D, and 27E shown in the arrangement number of the cross direction of the air nozzles 12A, 12B, 12C, 12D, and 12E shown in drawing 1 (b) (**), or drawing 5 (b) (**). Although what put in order and formed the discharge parts 8a, 8b, 8c, and 8d of four rows in the transportation direction was shown, In that the row number may be determined free as long as it is within the limits in which discernment by the material discrimination devices 7A, 7B, 7C, 7D, and 7E is possible, and drawing 5 (b) (**), That it is arbitrary to provide two or more steps of combination of the band conveyor 23 and the exhaust 25 in a transportation direction according to the kind of waste which should be sorted out, others, Of course, change can be variously added within limits which do not deviate from the gist of this invention.

[0022]

[Effect of the Invention]As stated above, according to the selecting method and device of waste of this invention, to the upstream upper position of a carrying conveyer. The construction material of the waste on a conveyor is identified with two or more material discrimination devices arranged crosswise [of this conveyor], According to the identified construction material, from two or more discharge parts to which each above-mentioned material discrimination device is made to have corresponded. Make alternative discharge of the above-mentioned waste into the method of making it perform, and to the upstream upper position of a carrying conveyer. Arrange two or more material discrimination devices for identifying the construction material of the waste conveyed crosswise [of this conveyor], and they are installed in it, And a discharge part provided with the exhaust it was made to pressure upwards waste by a high pressure air from two or more places of the cross direction, Since it has composition it was made to make waste discharge with the predetermined exhaust of the discharge part corresponding to the construction material which provided in two or more places which meet a transportation direction at a downstream position, and was identified by each above-mentioned material discrimination device rather than each above-mentioned material discrimination device, Even if it is a case where it is able to receive so that the waste of different construction material may be located crosswise in a line, can sort out each waste for every construction material in necessary width, and arrange two or more material discrimination devices for identifying further the construction material of the waste conveyed in the upstream upper position of a carrying conveyer crosswise [of this conveyor], and they are installed in it, And rather than each above-mentioned material discrimination device, make this each material discrimination device correspond to a downstream position, and two or more discharge gates are provided crosswise, By having composition it was made to make waste discharge from the discharge gate corresponding to the cross direction according to the construction material identified by each above-mentioned material discrimination device, respectively, The outstanding effect that the purity of the construction material of the waste which could sort out waste easily by opening and closing of the discharge gate, therefore was sorted out can be raised is demonstrated.

[Translation done.]

TECHNICAL FIELD

[Field of the Invention]This invention relates to the selecting method and device of waste which are used in order to sort out the disposal plastic and paper garbage which are contained in waste for every construction material of the.

[Translation done.]

PRIOR ART

[Description of the Prior Art]As a selector conventionally used in order for the waste to sort out a disposal plastic, paper garbage, etc. for every construction material and to perform such sorting, With the material discrimination device arranged to the pars intermedia of a carrying conveyer, the construction material of the waste conveyed on this carrying conveyer is identified, For example, only when it is identified that it is an abandonment plastic of the construction material which waste should sort out, He is trying to make sorting according to construction material perform by blowing away with exhaust air from on a carrying conveyer, or operating the exhaust like the discharge gate provided so that it might open and close to the floor line of the shot which stands in a row in the downstream of the above-mentioned discharging conveyor.

[Translation done.]

EFFECT OF THE INVENTION

[Effect of the Invention]As stated above, according to the selecting method and device of waste of this invention, to the upstream upper position of a carrying conveyer. The construction material of the waste on a conveyor is identified with two or more material discrimination devices arranged crosswise [of this conveyor], According to the identified construction material, from two or more discharge parts to which each above-mentioned material discrimination device is made to have corresponded. Make alternative discharge of the above-mentioned waste into the method of making it perform, and to the upstream upper position of a carrying conveyer. Arrange two or more material discrimination devices for identifying the construction material of the waste conveyed crosswise [of this conveyor], and they are installed in it, And a discharge part provided with the exhaust it was made to pressure upwards waste by a high pressure air from two or more places of the cross direction, Since it has composition it was made to make waste discharge with the predetermined exhaust of the discharge part corresponding to the construction material which provided in two or more places which meet a transportation direction at a downstream position, and was identified by each above-mentioned material discrimination device rather than each above-mentioned material discrimination device, Even if it is a case where it is able to receive so that the waste of different construction material may be located crosswise in a line, can sort out each waste for every construction material in necessary width, and arrange two or more material discrimination devices for identifying further the construction material of the waste conveyed in the upstream upper position of a carrying conveyer crosswise [of this conveyor], and they are installed in it, And rather than each above-mentioned material discrimination device, make this each material discrimination device correspond to a downstream position, and two or more discharge gates are provided crosswise, By having composition it was made to make waste discharge from the discharge gate corresponding to the cross direction according to the construction material identified by each above-mentioned material discrimination device, respectively, The outstanding effect that the purity of the construction material of the waste which could sort out waste easily by opening and closing of the discharge gate, therefore was sorted out can be raised is demonstrated.

[Translation done.]

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]However, in the selector used conventionally [above-mentioned], If passage of the waste of the construction material which should be sorted out on a carrying conveyer is detected and the carrying position of this waste is detected by an identification unit, In order to blow away a part for the overall width of the carrying conveyer in the above-mentioned carrying position with exhaust air at once, or to make a shot floor line carry out the opening operation of the discharge gate provided so that it might extend all over the cross direction and to try to make it carry out dropping ejection of the part for overall width at once, When wastes of different construction material, such as a disposal plastic and paper garbage, are conveyed along with the cross direction on a carrying conveyer, there is a problem that the purity of the construction material of the waste sorted out is low, from making both discharge simultaneously.

[0004]Then, this invention can be sorted out for every construction material, even if the waste in which construction material differs is conveyed along with the cross direction on the carrying conveyer, and it is going to provide the selecting method and device of waste which can raise the purity of the construction material of the waste sorted out.

[Translation done.]

MEANS

[Means for Solving the Problem]In order that this invention may solve an aforementioned problem, to an upstream upper position of a carrying conveyer. Construction material of waste on a conveyor is identified with two or more material discrimination devices arranged crosswise [of this conveyor], According to identified construction material, from two or more discharge parts to which each above-mentioned material discrimination device is made to have corresponded. To a selecting method of waste to which alternative discharge of the above-mentioned waste is made to perform, and an upstream upper position of a carrying conveyer. Arrange two or more material discrimination devices for identifying construction material of waste conveyed crosswise [of this conveyor], and they are installed in it, And a discharge part provided with the exhaust it was made to pressure upwards waste by a high pressure air from two or more places of the cross direction, It provides in two or more places which meet a transportation direction rather than each above-mentioned material discrimination device at a downstream position, and is considered as a selector of waste it was made to make waste discharge with the predetermined exhaust of a discharge part corresponding to construction material identified by each above-mentioned material discrimination device.

[0006]If waste is led on a carrying conveyer, construction material will be identified by independent or plurality among two or more material discrimination devices located crosswise in a line, and this waste. It is pinpointed by position of the cross direction on a carrying conveyer by the position of an identified material discrimination device, and by this, Discharge only by a position of the cross direction where the above-mentioned waste was detected is performed by making it discharge using a high pressure air by the exhaust located downstream from the above-mentioned material discrimination device which performed discernment among two or more exhausts located crosswise in a line.

[0007]Crosswise, arrange two or more material discrimination devices for identifying construction material of waste conveyed crosswise [of this conveyor], and they are installed in an upstream upper position of a carrying conveyer, And rather than each above-mentioned material discrimination device, make this each material discrimination device correspond to a downstream position, and two or more discharge gates are provided crosswise, A corresponding discharge gate is opened by position of a material discrimination device by having composition it was made to make waste discharge from a discharge gate corresponding to the cross direction

according to construction material identified by each above-mentioned material discrimination device, respectively.

[0008]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described with reference to drawings.

[0009]Drawing 1 (b) (**) and drawing 2 are what shows the selecting method of the waste of this invention, and one gestalt of operation of a device, The bag tearing machine 2 for taking out the waste 1 which put into the bag and were collected from a bag, and the vibration screen 3 for removing the ingredient 1a with fine size in the above-mentioned waste, The operating conveyor 4 classified by hand sorting for removing manually the processing unsuitable things 1b, such as a string-like thing which automatic sorting cannot perform easily, is installed in order, and the construction material selector 5 for sorting out the waste 1 for every construction material of the in the downstream position of this operating conveyor 4 classified by hand sorting is formed.

[0010]Make the band conveyor 6 for conveying the waste 1 which received from the above-mentioned operating conveyor 4 classified by hand sorting incline so that it may become a downhill grade a little to a transportation direction, and the above-mentioned construction material selector 5 arranges it, And the material discrimination devices [two or more / above the transportation direction upstream position of this band conveyor 6 / crosswise / (the drawing 1 (**) five pieces)] 7A, 7B, 7C, 7D, and 7E are formed, Each discharge parts 8a, 8b, 8c, and 8d respectively corresponding to the construction material of the waste 1 are made a downstream position with the composition provided in two or more places of the transportation direction from each material discrimination devices 7A, 7B, 7C, 7D, and 7E of the above-mentioned band-conveyor 6 upper part.

[0011]When it explains in full detail, each above-mentioned discharge parts 8a, 8b, 8c, and 8d, Covering the overall length of the longitudinal direction of the belt 9 of the band conveyor 6, with a prescribed interval. It lets the hole 10 for exhaust air blow off which each above-mentioned material discrimination devices 7A, 7B, 7C, 7D, and 7E were made to correspond, and was drilled crosswise [of the belt 9] pass. In order to pressure upwards upwards the waste 1 which the high-pressure exhaust air 11 is blown off [waste] from a lower part upwards, and has a conveyance face top of the belt 9 conveyed from the conveyance face of the belt 9, The air-nozzle unit 13 which consists of the air nozzles 12A, 12B, 12C, 12D, and 12E as the exhaust arranged to the conveyance face side down side of the belt 9, Have the discharging conveyor 15 formed in the upper position of the conveyance face send to the discharging tray 14 provided in the upper bed part in response to the waste 1 pressured upwards from a conveyance face by the high pressure air 11 which blows off from the air nozzles 12A-12E of each of this air-nozzle unit 13, and it is made to make discharge, and further, It has composition which connects with the air supply part which does not illustrate each air nozzles 12A, 12B, 12C, 12D, and 12E of the above-mentioned air-nozzle unit 13, respectively, and enabled it to blow off the exhaust air 11 independently for every air nozzle, In each downstream position of each above-mentioned ********** 7A, 7B, 7C, 7D, and 7E, the waste 1 on a conveyance face is pressured upwards to the discharging conveyor 15, and it enables it to have discharged.

[0012]As the above-mentioned material discrimination devices 7A, 7B, 7C, 7D, and

7E, what can identify PET, PVC, other plastics, and four sorts of construction material of paper is used, for example. 16 has protruded on the conveyance face of the surface of the belt 9 stop sliding, and it is made to have not shifted while each position of the waste 1 which held the waste 1 to the upper position of the hole 10, and identified construction material with the material discrimination devices 7A, 7B, 7C, 7D, and 7E conveys. 17 is the foreign matter receptacle provided in the downstream end of the band conveyor 6, in order to receive the foreign matters 18 in which it is not identified with the above-mentioned material discrimination devices 7A, 7B, 7C, 7D, and 7E, therefore discharge is not performed in which discharge parts 8a, 8b, 8c, and 8d, such as metal and earthenware.

[0013]After putting into a bag, being collected and being taken out from a bag with the bag tearing machine 2, the ingredient 1a with fine size is removed by the vibration screen 3, If the waste 1 which has removed the processing unsuitable thing 1b in the operating conveyor 4 classified by hand sorting is supplied to the construction material selector 5, the construction material of the waste 1 will be identified by the material discrimination devices 7A, 7B, 7C, 7D, and 7E which are divided crosswise along with the belt 9 and put in order.

[0014]If one side of the now 9, for example, a belt, is sent in the waste 1 and the material discrimination device 7A identifies the construction material, It is made to make the high pressure air 11 from the air nozzle 12A of the discharge part 8a perform discharge of a up to [the discharging conveyor 15] according to the identified construction material among the discharge parts 8a, 8b, 8c, and 8d located in a line with a transportation direction in the waste 1.

[0015]Namely, in the case where it is assumed that waste PET bottle 19 as the waste 1, waste PVC20, and the paper garbage 21 are sent along with the cross direction on the band conveyor 6 of the construction material selector 5 as shown in drawing 2, the inside 7A, 7B, and 7C of a material discrimination device -- the construction material of PET bottle 19 -- 7D -- the construction material of waste PVC20, if the construction material of the paper garbage 21 is identified by 7E, respectively, For example, in the discharge part 8a by the side of the Mogami style 1 second after passing the material discrimination devices 7A, 7B, 7C, and 7D and the 7E section, So that the high pressure air 11 may blow off from the air nozzles 12A, 12B, and 12C corresponding to the above-mentioned material discrimination devices 7A, 7B, and 7C, Exhaust air is supplied from an air supply part by the control device which is not illustrated, and it is made to pressure upwards and discharge to the discharging conveyor 15, as a dashed dotted line shows only above-mentioned waste PET bottle 19 to drawing 2. Next, as shown in drawing 3, waste PVC20 and the paper garbage 21 which remain on the conveyance face of the band conveyor 6 are conveyed on this band conveyor 6, and 1 second after passage of the above-mentioned discharge part 8a, In [if the discharge part 8b located in the downstream of this discharge part 8a is reached as a two-dot chain line shows to drawing 3] this discharge part 8b, The high pressure air 11 blows off from the air nozzle 12D corresponding to the material discrimination device 7D, and it is made to pressure upwards and discharge to the discharging conveyor 15, as a dashed dotted line shows only PVC20 to drawing 3. Subsequently, in [if the discharge part 8c located in the downstream of this discharge part 8b is reached as a two-dot chain line shows to drawing 4] 1 second after the paper garbage 21 which remains on the conveyance face of the band conveyor 6 passes the above-mentioned discharge part 8b, as shown in

drawing 4] this discharge part 8c, The high pressure air 11 blows off from the air nozzle 12E corresponding to the material discrimination device 7E like the above, and the above-mentioned paper garbage 21 is pressured upwards to the discharging conveyor 16, and it is made to make it discharge, as a dashed dotted line shows to drawing 4.

[0016]Thus, divide two or more conveyance faces of the band conveyor 6 crosswise, and the kind of waste 1 passed for every divided part is identified with the material discrimination devices 7A, 7B, 7C, 7D, and 7E, In the discharge parts 8a, 8b, 8c, and 8d which were identified by these each material discrimination devices 7A, 7B, 7C, 7D, and 7E and which were beforehand set up for every construction material, From trying to make implementation of discharge, and non-working determine for every portion which divided two or more conveyance faces crosswise, respectively. The purity of the construction material of the waste 1 which could sort out each waste 1 for every construction material even when the waste 1 of the construction material which changes with band conveyors 6 of the construction material selector 5 was conveyed along with the cross direction, therefore was sorted out can be raised.

[0017]Next, drawing 5 (b) (**) like what shows other gestalten of operation of this invention and was shown in drawing 1 (b) (**), After putting into a bag, being collected and being taken out from a bag with the bag tearing machine 2, the ingredient 1a with fine size is removed by the vibration screen 3, The waste 1 which has removed the processing unsuitable thing 1b in the operating conveyor 4 classified by hand sorting in the middle of the band conveyor 23 on which it is made to be supplied above a position, The material discrimination devices 7A, 7B, 7C, 7D, and 7E for dividing into plurality crosswise and identifying the construction material of the waste 1 are formed, further, the exhaust 25 is arranged to the downstream of the above-mentioned band conveyor 23, and the construction material selector 22 is constituted in it.

[0018]The shot 24 which formed the above-mentioned exhausts 25 successively at the downstream end of the above-mentioned band conveyor 23, The opening 26 formed in the pars intermedia of this shot 24, and two or more discharge gates 27A, 27B, 27C, 27D, and 27E which were attached to opening 26 upper limb, enabling the free rotation to a sliding direction, and were arranged in crosswise [of the opening 26] so that this opening 26 might be blockaded, It has gate type composition which consists of the actuator 28 like the fluid pressure cylinder is connected with the back side of each of these discharge gates 27A-27E, and it is made to make each discharge gates 27A-27E open and close independently. 29 is the discharging tray provided in the downward position of the shot 24. Each above-mentioned discharge gate 27A - the 27E material discrimination devices 7A-7E are made to have corresponded.

[0019]According to this embodiment, the kind of waste 1 conveyed in the state where it was dotted crosswise on the conveyance face of the band conveyor 23 is individually identified with the material discrimination devices 7A, 7B, 7C, 7D, and 7E which divide crosswise [of a conveyor] and are formed, According to the construction material of the garbage identified by either of these each material discrimination devices 7A, 7B, 7C, 7D, and 7E, It is operated by the instructions from the control device which the actuator 28 of the discharge gate where it corresponds of the discharge gates 27A, 27B, 27C, 27D, and 27E of the exhaust 25

does not illustrate, By carrying out an opening operation, as a two-dot chain line shows a discharge gate to drawing 5 (b), dropping ejection can be carried out to the discharging tray 29 through the opening 26 of the shot 24.

[0020]Therefore, even when the waste 1 of different construction material on the band conveyor 23 is conveyed in the state where it was arranged crosswise, only paper garbage is sorted out among each waste 1, it can dissociate and the purity of the construction material of the waste 1 sorted out can be raised.

[0021]Although this invention is not limited only to the above-mentioned embodiment and the material discrimination devices 7A, 7B, 7C, 7D, and 7E showed what was put in order and provided crosswise [five] by drawing 1 (b) (**) and drawing 3 (b) (**), The division number of the cross direction of these material discrimination devices 7A, 7B, 7C, 7D, and 7E, May make it fluctuate according to the width of the conveyance face of the band conveyor 6, and again, It corresponds to the number of the cross direction of these material discrimination devices 7A, 7B, 7C, 7D, and 7E. By what was shown in that it may be made to fluctuate and drawing 1 (b) (**), the arrangement number of the cross direction of the **** discharge gates 27A, 27B, 27C, 27D, and 27E shown in the arrangement number of the cross direction of the air nozzles 12A, 12B, 12C, 12D, and 12E shown in drawing 1 (b) (**), or drawing 5 (b) (**). Although what put in order and formed the discharge parts 8a, 8b, 8c, and 8d of four rows in the transportation direction was shown, In that the row number may be determined free as long as it is within the limits in which discernment by the material discrimination devices 7A, 7B, 7C, 7D, and 7E is possible, and drawing 5 (b) (**), That it is arbitrary to provide two or more steps of combination of the band conveyor 23 and the exhaust 25 in a transportation direction according to the kind of waste which should be sorted out, others, Of course, change can be variously added within limits which do not deviate from the gist of this invention.

[Translation done.]

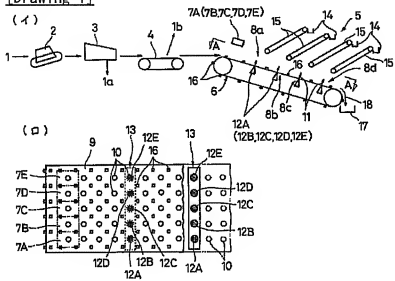
DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]The selecting method of the waste of this invention and one gestalt of operation of a device are shown, (b) is a whole outline side view and (**) is an A-A view enlarged drawing of (b).
[Drawing 2]the construction material selector of the device of drawing 1 is shown -- it is a cutting outline perspective view in part.
[Drawing 3]in the construction material selector of the device of drawing 1, the state of conveying waste PVC and paper garbage which remain on a band conveyor is shown -- it is a cutting outline perspective view in part.
[Drawing 4]in the construction material selector of the device of drawing 1, the state of conveying the paper garbage which remains on a band conveyor is shown -- it is a cutting outline perspective view in part.
[Drawing 5]The construction material selector of other gestalten of operation of this invention is shown, (b) is an outline side view and (**) is an outline top view.
[Description of Notations]
1 Waste
5 Construction material selector
6 Band conveyor (carrying conveyer)
7A, 7B, 7C, 7D, and 7E Material discrimination device
8a, 8b, 8c, and 8d Discharge part
12A, 12B, 12C, 12D, and 12E Air nozzle (exhaust)
22 Construction material selector
23 Band conveyor (carrying conveyer)
25 Exhaust
27A, 27B, 27C, 27D, 27E discharge gate

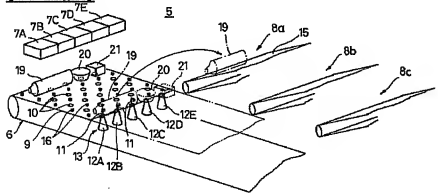
[Translation done.]

DRAWINGS

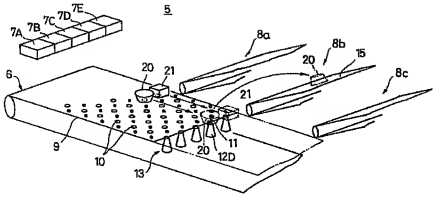
[Drawing 1]



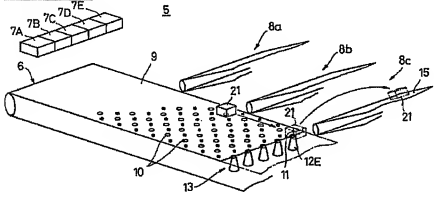
[Drawing 2]



[Drawing 3]

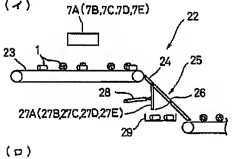


[Drawing 4]



[Drawing 5]

(イ)



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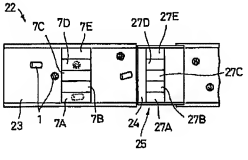

[Translation done.]